

Probabilistic Earthquake Hazard Maps for the State of Montana

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Because of the potential earthquake threat to dams in Montana, a set of probabilistic earthquake ground motion maps have been developed for the Montana Department of Natural Resources and Conservation (DNRC) Dam Safety Program. These maps will be used by DNRC to (1) check site-specific seismic hazard evaluations required of all owners of high-hazard dams and (2) to prioritize Montana's dams in terms of hazards and risk, for potential remediation. The maps will also be used by practicing engineers in seismic stability analyses of dams in the State using procedures recommended by DNRC.

The 18 statewide maps on this CD display peak horizontal acceleration and 0.2 and 1.0 sec (5 Hz and 1 Hz, respectively) horizontal spectral acceleration hazard for approximate return periods of 500, 2,500, and 5,000 yr (exceedance probabilities of 10%, 2%, and 1% in 50 yr, respectively). The maps display ground motions for two site conditions: soft rock and the ground surface. In addition to the ground shaking maps, a set of 6 maps have been developed to aid DNRC and practicing engineers in the analysis of site response and liquefaction potential. These maps display the modal earthquake magnitude and modal distance of the magnitude–distance distribution that contribute to the hazard at a specified location for the three return periods.

These maps are not intended to be a substitute for site-specific studies for engineering design nor to replace standard maps commonly referenced in building codes. Rather, we hope that these maps will be used as a guide by government agencies; the engineering, urban planning, and emergency preparedness and response communities; and the general public as part of an overall program to reduce earthquake risk and losses in Montana.

To view the maps and appendix, click on the listed titles.



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Plate 16 10% probability of exceedance in 50 years, 1.0 sec horizontal spectral acceleration (g) at the ground surface

Plate 17 2% probability of exceedance in 50 years, peak horizontal acceleration (g) at the ground surface

Plate 18 2% probability of exceedance in 50 years, 0.2 sec horizontal spectral acceleration (g) at the ground surface

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Plate 20 1% probability of exceedance in 50 years, peak horizontal acceleration (g) at the ground surface

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Plate 23 10% probability of exceedance in 50 years, modal magnitude for peak horizontal acceleration hazard on rock

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Plate 28 1% probability of exceedance in 50 years, modal distance for peak horizontal acceleration hazard on rock

Appendix Montana Fault Source Parameters for Seismic Source Model
